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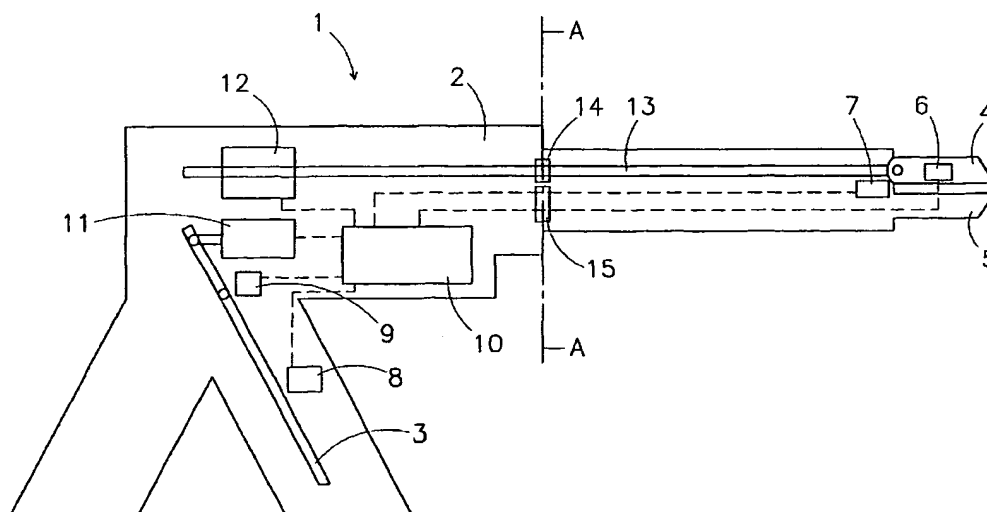
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[Continued on next page]

(54) Title: **SURGICAL INSTRUMENT**



(57) Abstract: The invention relates to an instrument for surgery, in particular minimally invasive surgery. The instrument comprises means for feeding back a force which is exerted on the working element of the instrument to the operating element. These means comprise at least a first force sensor for measuring the force which is exerted on the working element, a control unit and a first actuator. On the basis of a signal which originates from the first force sensor, the control unit controls at least the first actuator in order to control the operating element. Furthermore, the means preferably comprise a first position sensor for measuring a position of the working element with respect to the frame. The control unit advantageously determines an impedance which the working element is subject to as a result of the presence of a tissue or the like, on the basis of which impedance the control unit controls at least the first actuator.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/NL 02/00574

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/28 A61B19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 609 607 A (HECHTENBERG KURT-VOLKER ET AL) 11 March 1997 (1997-03-11) column 2, line 47 -column 3, line 15 abstract; claim 1; figure 1 ---	1-17
X	WO 00 51486 A (COMPUTER MOTION INC) 8 September 2000 (2000-09-08) page 11, paragraph 2 page 18, paragraph 4 -page 20, paragraph 1 page 36, line 29 -page 38, line 1; figures 7,8 ---	1-17
X	US 5 389 849 A (ASANO TAKEO ET AL) 14 February 1995 (1995-02-14) column 6, line 65 -column 7, line 59 column 12, line 8 - line 16; figure 1 ---	16,17
A	---	3
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/NL 02/00574

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 125 557 A (HITACHI LTD) 22 August 2001 (2001-08-22) abstract page 13, line 30 - line 35; figures 1,2 ---	16,17
A	WO 98 51451 A (VIRTUAL TECHNOLOGIES INC) 19 November 1998 (1998-11-19) page 16, line 20 - page 17, line 12; figure 1 ---	3,16,17
A	US 5 965 880 A (WOLF RAINER ET AL) 12 October 1999 (1999-10-12) abstract; claims 1,4; figure 2 -----	8-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL 02/00574

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-17

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-17

Surgical instrument

2. Claims: 18, 19

Force or position sensor

INTERNATIONAL SEARCH REPORT

 Intr I Application No
 PCT/NL 02/00574

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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